MD&A Disclosure Tone and Audit Pricing

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For Cecilia, Tong and Mom

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ABSTRACT

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Zenghui Liu

This dissertation examines whether a qualitative component of the common information set between auditors and their clients is used in audit pricing decisions. I specifically focus on information contents of managers' disclosure tone within the management discussion and analysis (MD&A) sections of annual reports. I find a significant negative association between audit fees and optimistic disclosure tone. This finding is consistent with prior research that auditors use client specific information in audit pricing decisions. Further analysis shows that in high litigation environment the tone fee relation is stronger. This paper contributes to the current audit fee literature by documenting the effect of qualitative information, such as the disclosure tone, on the pricing decision by auditors.

CHAPTER 1: INTRODUCTION

Prior literature suggests that auditors use quantitative client specific information in audit pricing (Hay, Knechel and Wong 2006). This paper extend this literature by examining whether a qualitative component of financial reports, MD&A disclosure tone, is used in audit pricing decisions. [1] While there is a growing literature on disclosure tone, most studies focus on how investors or financial analysts react to the tone. Since the qualitative contents provide additional information to the quantitative contents (Kothari Li and Short 2009), and it should affect auditors' pricing decisions. To my knowledge, there is little research that has examined whether tone information affect auditors' pricing decisions. By filling this gap, this paper contributes to audit pricing literature. Additionally, the finding on the effect of disclosure tone on audit pricing can help researchers gain understanding on the economic consequences of disclosure tone.

In Simunic's (1980) analytical model, rational auditors should incorporate any information related to engagement risk into their audit pricing decisions. Based on this model, empirical audit fee research documents the effects of client firms' risk factors based on quantitative components found in financial reports (Hay et al. 2006; Hay 2013). In addition, a few recent studies empirically test and find evidence that auditors use firm specific private information in audit pricing (Stanley 2011; Picconi

[1] Because MD&A sections are reviewed by auditors, MD&A disclosure tone information is treated as part of the common information set shared between auditors and client firm managers in this study.

and Reynolds 2013; Hackenbrack, Jenkins and Pevzner 2013; Hribar, Kravet and Wilson 2014). While the information shared between managers and auditors could be both private and public, such information could also contain both qualitative and quantitative components. This paper focuses on examining how qualitative information impacts auditors' pricing decisions.

The informational content revealed by the disclosure tone should influence auditors' pricing decisions for the following reasons. First, while the quantitative financial disclosure provides information on the looking-back performance of the firm, the tone of disclosure may provide forward looking information on client business risk. Client business risk is the uncertainty that an audit client firm's economic condition will deteriorate in foreseeable future (Stanley 2011). Such risk is a critical determinant of whether financial statements contain material misstatements due to error or fraud (AICPA 1983), therefore it is also an important factor in auditor pricing (O'Keefe, Simunic and Stein 1994). Since the disclosure tone could indicate future firm performance (Brayn 1997; Li 2006; Li 2010), an optimistic tone is likely to be associated with lower client business risk, which leads to lower audit efforts and lower audit fees. Second, prior literature (Pava and Epstein 1993; Clarkson, Kao, and Richardson 1999; Rogers and Stocken 2005; Li 2008) suggests that managers tend to provide good news rather than bad news in the MD&A sections, and such selectivity in disclosure affects the perception of financial analysts and investors (Henry 2008; Davis, Piger and Sedor 2008; Demers and Vega 2008). More importantly, Rogers, Buskirk and Zechman (2011) provide evidence that an overly optimistic tone

disclosure increases firm litigation risk.[2] Since auditors may lose reputational capital when their clients are sued (Reynolds and Francis 2000), they may charge a higher risk premium for overly optimistic disclosing clients to protect themselves. The above arguments suggest that the information content of disclosure tone should be important to audit pricing decisions, however the direction in which such informational content impacts auditors' pricing decisions is not clear. Therefore, it is an empirical question to test how disclosure tone impacts audit pricing decisions.

To capture management's disclosure tone, this paper focuses on the management discussion and analysis (MD&A) sections of annual reports. The MD&A reflects both what managers believe about the firm's past events and their expectations for the near future (SEC 1983). The forward-looking qualitative information contained in the MD&A has an overlap scope with the audit fee contract (i.e. the engagement letter) for the fiscal year to be audited.[3] Such a feature of MD&A sections makes them good subjects to study whether qualitative information has an impact on audit pricing decisions. The tone of a MD&A is measured by the frequency difference of positive and negative words in the MD&A section using dictionaries developed by prior studies (Stone, Dunphy, Smith and Ogilvie 1966; Hart 2000; Henry 2008; Loughran and McDonald 2011).

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[2] There is also empirical evidence that links an optimistic tone to fraud risk. This link will be discussed more in the hypothesis part of this study.

[3] The engagement letter is the auditing contract, which documents the auditor's understanding of the terms of an engagement (Auditing standard 311).

Focusing on the component of the disclosure tone that is not explained by firm performance, I find optimistic scores of disclosure tone are negatively associated with audit fees. This finding implies that, on average, auditors view an optimistic tone as a signal from managers about their firms' good future performance (i.e. lower audit risk). More importantly, this evidence also supports the argument that qualitative information has impacts on auditors' pricing decisions. This result is robust in a number of additional tests. I next explore the factors that may attenuate or strengthen the association between the disclosure tone and audit fees. In particular, I examine the moderating effects of the litigation environment and earnings informativeness on the tone fee relationship.

The litigation environment could moderate the tone fee relationship because such an environment is likely to impact both the disclosure strategies of managers as well as auditors' pricing decisions. Prior literature documents evidence that managers will forecast less frequently and disclose more conservatively under litigation pressure (Johnson, Kasznik and Nelson 2001; Nagar, Nanda and Wysocki 2003; Baginski, Hasell and Kimbrough 2002; Rogers and Stocken 2005). If managers also disclose conservatively in tone, there will be a weaker client risk effect under litigation pressure. At the same time, there is evidence that auditors also behave conservatively and charge a higher fee to their risky clients in order to protect themselves (Pratt and Stice 1994; Krishnan and Krishnan 1997). Specifically, Chen, Krishnan and Pevzner (2012) observe that the audit fee premium is higher for firms that disclose optimistic non-GAAP earnings post-Sarbanes-Oxley Act (SOX), in comparison to pre-SOX. If

auditors charge a higher fee premium for an optimistic disclosure tone in high litigation environment, there will be a strong client risk effect under litigation pressure. Overall, the directional change of the tone fee relationship under litigation pressure is not clear. I test the tone fee relationship between high litigation industries (following Francis, Philbrick and Schipper 1994 definition) and low litigation industries, and pre-SOX versus post-SOX sample periods. I find that the negative association between disclosure tone and audit fees is stronger in the high litigation industries. This result is consistent with the mangers' conservativeness in disclosure when facing litigation pressure. No evidence of difference of tone fee relationship between pre-SOX and post-SOX period is found.

For low earnings informativeness firms, future earnings are not well reflected from current stock price and earnings. Early analytical research (Barry and Brown 1986; Merton 1987; Easley and O'hara 2004) posits and later empirical studies confirms that mangers use voluntary disclosures to signal information to market participants to mitigate information risk, and that such firms benefit through a lower cost of capital (Botosan 1997; Botosan and Plumlee 2002;Cheynel 2013). In the same vein, Muslu, Radhakrishnan, Subramanyam, and Lim (2014) find that firms tend to make more forward looking disclosures in the MD&A when their stock price poorly reflects future earnings information. Since the disclosure tone is found to contain information about firm's future earnings and is correlated with future stock performance (Bryan 1997; Li 2010), managers could also use the disclosure tone as a tool to signal more when the firm has low earnings informativeness. Therefore, I

conjecture that the signal effect will be stronger for low earnings informativeness subsample. Using the earnings response coefficients as the proxy for earnings informativeness, I don't find supporting evidence for this hypothesis. I will discuss this result further in later sections.

This study contributes to prior literature at least in the following two ways. Firstly, a large literature documents that auditors incorporate risk related public financial information (Hay et al. 2006; Hay 2013), as well as private information into audit pricing decisions (Pratt and Stice 1994; Johnstone and Bedard 2001; Stanley 2011; Picconi and Reynolds 2013; Hackenbrack et al. 2013). By linking disclosure tone literature and audit fee determinant literature together, this paper provides first evidence on the information content of audit fees literature that qualitative information has an impact on the auditors' pricing decisions.

Secondly, this study also adds knowledge to ongoing research that explores the economic consequences of disclosure tone. Kothari et al. (2009) observe that a number of desirable consequences of favorable disclosure tone, such as a decreased cost of capital, lower stock return volatility, and higher analyst forecast accuracy. Davis et al. (2012) find that the increase in tone optimism is associated with the immediate stock price response to earnings announcements. These results support the hypothesis that an optimistic disclosure tone is a signal of lower firm risk to the investors and financial analysts. This paper extends this literature by providing evidence that an optimistic disclosure tone is also an indicator of lower audit risk, which is associated with lower audit fees.

The remainder of this dissertation is organized as follows. The next chapter reviews related prior literature and develops my hypotheses. Chapter 3 discusses my research design and sample selection, and Chapter 4 presents results. Chapter 5 concludes this paper.

CHAPTER 2: PRIOR LITERATURE AND HYPOTHESES DEVELOPMENT

2.1 *The Information Content of Audit Fees*

Audit fee negotiations between auditors and the managers of their client firms conclude with the engagement letter, which is typically approved by the board meeting together with the release of the prior year's financial results. Once the engagement letter is approved and signed by the related parties, audit fees are settled for the fiscal year to be audited (Audit Standard 16). The fees can only be changed with significant unexpected changes in audit labor, and through a mutual agreement between auditors and the management team of their clients (Hackenbrack and Hogan 2005). The timeline of setting audit fees and annual report filling events is presented in Figure 1.

<Insert Figure 1 here>

Because of the hard to adjust nature of negotiated fees, auditors usually spend significant amount of time and effort collecting and appraising client specific information, such as the anticipated future financial performance, discontinued operations, litigation risk, business strategies, industry information, and even macro-economy information during the fee negotiation (Bell, Landsman and Shakelford 2008; Picconi and Reynolds 2013; Hackenbrack et al. 2013). Therefore, to the largest extent possible, auditors will incorporate the engagement risk related both public and private client specific information into their audit scope and consequently pricing decisions. Part of the client specific information could be qualitative in format, which

cannot be measured through financial reporting numbers, for instance, the client business competition advantage information. Such information is typically discussed in the MD&A sections to present year to year changes in the company's economic situation (Brown and Tucker 2011). This is a possible reason why qualitative information has additional contents to numerical financial results for audit pricing decisions.

Audit fee prediction models typically include audit supply factors, such as, client firm audit complexity (client firm size, level of account receivables and inventories, foreign operation indictor, number of business segments, audit reporting lag length, special items indictor, fiscal year end busy season indictor), client firm financial performance (return on assets, loss indictor, quick ratio, current ratio, book to market ratio, leverage ratio), and factors that impact audit demand, such as auditor characteristics (BigN auditor indictor, auditor tenure length, industry specialist indictor). Those audit supply factors are typically derived from financial reporting numbers, and are found to be associated with audit fees in the predicted directions consistent with the Simunic's theory (e.g. Simunic 1980; Palmrose 1986; Crashwell, Francis and Taylor 1995; Abbot 2003; Gul, Chen, and Tsui 2003; Antle, Gordon and Narayanamoorthy 2006; Chang, Cheng and Reichelt 2010; Defond, Lim and Zang 2013). See Hay et al. (2006) and Hay (2013) for a complete review and detailed discussions of this trend of research.

In addition to the client risk factors measured by numerical financial reporting results, private information is also used in audit pricing decisions. Using proprietary

data from large CPA firms, some early research (Pratt and Stice 1994; Johnstone and Bedard 2001) show that the audit bid price contains client specific private information on both financial reporting errors and fraud risk. A few recent studies also examine the private information content of audit fees. Specifically, Stanley (2011) finds an inverse relationship between unexplained (or abnormal) audit fees and changes in future firm performance. Picconi and Reynolds (2013) find that unexplained audit fees are negatively related to stock returns in the small firm sample. Hribar et al. (2014) propose to use abnormal audit fees as an accounting quality measure. They find that the abnormal fee is useful for predicting restatements, fraud, and Securities and Exchange Commission (SEC) comment letters. Moreover, Hackenbrack, Jenkins and Pevzner (2013) posit that negotiated audit fees contain auditors' client specific knowledge about bad news events that investors will learn eventually, and finds a positive association between changes in audit fees and firm stock price crashes. Overall, this line of research finds consistent evidence that auditors use client specific private information in pricing decisions.

This study is built on the same theory ground as prior audit fee information content studies, however, different from the prior studies by focusing on the impacts of qualitative information on audit pricing decisions. Since the auditors need to review the MD&A sections during the preparation process (Hufner 2007), the disclosure tone is part of the common information set between auditors and their clients' firm managers. Therefore, the information content of the tone is available to auditors before the settlement of the auditing contract for the fiscal year to be audited.

I argue that the tone could be important for auditors' pricing because of the following reasoning.

2.1.1 *Signal Effect of Disclosure Tone*

Early analytical studies suggest that managers may signal to the market about firm performance to mitigate the adverse selection problem (Grossman 1981; Milgrom 1981). A company manager could use the qualitative property of a textual disclosure, such as the disclosure tone, to signal a firm's future accounting outcomes and stock performance to the market participants, in addition to the reported numerical financial results.[4] By focusing on 250 MD&A sections, Brayn (1997) manually categorizes the disclosure content by the reasons for revenues changes (such as, sales price changes, sales volume changes, cost changes, future liquidity, planned capital expenditure, etc.), and then codes the above content into favorable, neutral, or unfavorable (tone). He finds evidence that the disclosure tone is associated with future firm fundamentals (future sales, earning per shares, cash flow) and analysts' earnings forecast revisions. Using a computer program to measure the risk related key words frequency as the risk sentiment for over 30,000 annual reports, Li (2006) documents that the risk related disclosure tone of 10-K forms is correlated significantly with lower future earnings and more negative future stock returns. Furthermore, using the machine learning technique and the Naïve Bayesian algorithm, and by focusing on the forward looking statements in the MD&A sections, Li (2010) classifies the tone of

[4] Here, I only summarize the articles that examine the tone information content of the verbal part of corporate filings (10Qs and 10Ks). Please see Kearney and Liu (2014) for a complete review of disclosure tone literature.

such statements into positive, neutral, negative, and uncertain categories and finds that the tone is associated with future firm earnings, liquidity, and also has incremental explanatory power to other common proxies in predicting future stock returns. Finally, Bochkay and Levine (2014) find that a combination of the MD&A sentiment and quantitative numbers together (i.e. text enhanced models) leads to a better estimation of firms' future performance than models only using quantitative variables. Taken together, evidence from prior literature suggests that the disclosure tone has incremental information content about a company's future financial outcomes and stock performance, which has a large overlap with the client business risk accessed by external auditors.

Johnstone (2000) argues that client business risk, or the risk that an audit client's economic condition will deteriorate in the future, is one of the primary risks accessed by auditors.[5] An extensive audit literature (Pratt and Stice 1994; Morgan and Stocken 1998; Bell, Landsman and Shakelford 2001; Lyon and Maher 2005; Venkataraman, Weber and Willenborg 2008; Stanley 2011) documents that client business risk could impact audit effort, and therefore audit fees in the following two ways. Firstly, a client firm with high client business risk is likely to lack the necessary resources and internal controls to prepare reliable financial reports, and faces large pressure to commit fraud to hide declining performance (AICPA 1983, 1997). Secondly, the "deep pockets" of auditors could motivate investors to bring law suits

[5] Client business risk include, but not limited to the firm performance. Bell, Doogar and Solomon (2008) documents that auditors access clients' industry, strategy, business models and other qualitative information to evaluate client business risk.

against auditors to recover their losses, regardless of whether material misstatements exist in the financial statement or not (Wallace 1985). Overall, the risk of misstatement and litigation risk exposure will motivate auditors to provide more thorough and costly audit procedures to achieve an acceptable level of audit risk, or to charge a fee premium to high client business risk clients to protect themselves.

Using different client business risk proxies (return on assets, loss, liquidity ratio, stock returns), prior literature (Whisenant, Sankaraguruswamy and Raghunandan 2003; Francis and Wang 2005; Ghosh and Pawlewicz 2009; Stanley 2011) finds consistent evidence of a positive association between audit fees and the different dimensions of the client business risk of client firms. If an optimistic disclosure tone is a signal of lower client business risk in addition to reported financial results, then such a disclosure tone should be negatively associated with audit fees. I refer to this argument as the "signal effect" of disclosure tone.

2.1.2 *Client Risk Effect of Disclosure Tone*

In addition to the signal effect, prior literature also finds evidence that overly optimistic disclosures are related with risk of earnings management (i.e. fraud risk) and litigation risk. Jaggi and Sannella (1995) examine the relationship between the earnings forecasts errors and accounting changes under managers' discretion.[6] They find an association between the adoption of discretionary accounting changes and a

[6] Fraud is typically considered as very aggressive earnings management activities in accounting literature. In this paper, I use fraud risk and earnings management risk interchangeably.

higher accuracy of management earnings forecasts, and that such relationship is stronger for the negative pre-change forecast errors. This evidence is consistent with the theory that managers adopt discretionary accounting changes to match their prior overly optimistic earnings forecasts. Similarly, Kasznik (1999) examines whether firm managers who issue annual earnings forecasts manipulate reported financial results towards their forecast using the tool of discretionary accruals. After controlling for possible existing endogeneity, he finds that managers use income-increasing discretionary accruals to manipulate earnings results upward when reported numbers would otherwise drop below managers' prior forecasts. However, he doesn't find evidence of the mangers who have underestimated earnings to manage reported earnings downward.

Auditors are obligated to assess fraud risk, and exert additional time and effort to address the risk of fraud (O'Reilly, McDonnel, Winograd, Gerson and Jaenicke. 1998). Specifically, Statement of Auditing Standard 99 lists "overly optimistic press releases or annual report messages" as an indicator of fraud risk. The Pricewaterhouse audit manual mentions the following instructions for assessing fraud risk: "Undue emphasis placed on achieving earnings per share forecasts or on maintaining market value of capital stock, including overly optimistic news releases or communications to shareholders". Furthermore, Manry, Mock and Turner (2007) provide empirical evidence that incentive for managers to meet their overly optimistic forecasts will increase the fraud risk accessed by their external auditors, impact auditing effort, and result in more auditing fees charged by external auditors. In summary, prior literature

finds evidence that managers tend to manipulate earnings to meet their past overly optimistic quantitative earnings forecasts, and that such behavior could motivate their auditors to extend their effort to assess their client fraud risks, and charge more fees to such clients. Extending the above theory and evidence to the qualitative property of disclosure, such as an overly optimistic disclosure tone, I conjecture that if such a tone is useful for assessing a manager's earnings management risk, then it should be positively associated with audit fees.

In addition to providing more audit effort to reduce the fraud risk of their clients, auditors may also face direct economic losses or indirect reputational losses from shareholder litigations that originated from overly optimistic disclosures.[7] Under SEC rule 10b-5, shareholders can sue a company if they suffer from losses related with this company's misleading disclosure. Typical disclosure-related litigation plaintiffs allege that their expectation regarding the defendant firm future performance are too high because the managers distribute overly optimistic information or inadequately distribute pessimistic information (Rogers et al. 2011). Skinner (1994) argues that managers have implicit responsibility to inform the market participants timely with their knowledge of the firms' future performance. A company fails to do so will face the risk of investor litigation targeting on the misleading stock price. In other words, an overly optimistic disclosure may trigger a litigation event because there is usually a significant price drop when the market realizes that the firm

[7] Higher fraud risk leads to higher litigation risk, here I separate litigation risk from fraud risk because it is possible that an optimistic discourse tone may trigger a litigation event without the presence of fraud risk.

performance is below the expectation, and shareholders could initiate lawsuits to recover their losses from such price drops. Consistent with Skinner's (1994) findings, some shareholder lawsuits cited either optimistically biased management forecasts (quantitatively biased) or overly optimistic disclosure tone (qualitatively biased) as key factors that caused a misleading stock price.[8] More directly, Francis, Philbrick and Schipper (1994) examine whether the assessment of disclosure tone is related with the probability of getting sued in a sample from the period before the enactment of the Private Securities Litigation Reform Act of 1995 [PSLRA]. However, they find no relationship between tone and litigation. By focusing on a small post-PSLRA sample span from 2001 to 2008, Rogers, Buskirk and Zechman (2011) find that complainants targeted more optimistic reports in their lawsuits and that the earnings announcements of sued firms' are unusually optimistic relative to other firms in similar economic situations. This result suggests that an overly optimistic tone is associated with increased litigation risk. Moreover, Krishnan, Pevzne and Sengupta (2012) document an audit fee premium for optimistic earnings forecast firms. Chen et al. (2012) find that optimistic non-GAAP earnings (pro forma earnings) disclosure is also associated with higher audit fees. These results imply that an auditor's views of an overly optimistic disclosure tone as an additional litigation risk factor after controlling for reported financial results. In summary, this evidence suggests that the quantitative disclosure bias is correlated with a higher litigation risk, therefore

[8] Example firms with optimistic (quantitatively) biased disclosures that were sued include: Krisp Kreme (AAER 2941), Waters Corporation, Horizon Lines, PharmaNet (Krishnan et al. 2013); Example firms with overly optimistic tone disclosures that were sued include: VoiceFlash Networks; Metris Companies (Rogers et al. 2011);

resulting in higher audit fees. Since prior literature has found that disclosure tone (qualitative bias) is also associated with litigation risk, I conjecture that an overly optimistic disclosure tone is also associated with higher audit fees. Hereafter, I refer to this effect as the "client risk effect" of disclosure tone.

Although there are some guidelines from the SEC about the MD&A section of annual reports (SEC 1983; 1987; 1989), the tone is set by management and the MD&A section is only reviewed by auditors, and not audited. Managers have a broad liberty to decide what to say (content) and how to say it (tone). Depending on the degree of usage under the agency incentives, the disclosure tone could be used by managers to further inform investors about firm fundamentals (signal effect), or to obscure firm fundamentals, resulting in increased litigation risk (client risk effect). The above discussion of the signal effect versus the client risk effect suggests that *ex ante* the impact of an optimistic disclosure tone on the pricing decisions of auditors is not clear. Therefore, my first hypothesis makes the following competing predictions about the tone fee relationship:

H1a: If the signal effect dominates, then audit fees are negatively associated with the disclosure tone.

H1b: If the client risk effect dominates, then audit fees are positively associated with the disclosure tone.

2.2 *Litigation Environment and the Tone Fee Relationship*

Prior literature has found evidence that managers are conservative in the content of disclosures when they are facing litigation risks. The Jenkins Committee Report (1994) of the American Institute of Certified Public Accountants (AICPA) claims that "fear of litigation" is a major hindrance in providing forward-looking information in disclosure. Consistently, Baginski, Hasell and Kimbrough (2002) find that Canadian companies are likely to forecast more frequently, more precisely, and with longer forecast scope comparing to the matched US companies due to high litigation pressure in the United States. Moreover, Johnson, Kasznik and Nelson (2001) find managers tend to issue earnings forecast more frequently post-PSLRA. This result is in line with the theory that PSLRA reduces litigation pressure in general, which motivates managers to disclose more predictive information. In another similar study, Nagar, Nanda and Wysocki (2003) document that managers forecast more frequently post-PSLRA when firms offer CEO stock options. More importantly, using a probit model to estimate the likelihood of litigation, Rogers and Stocken (2005) regress management earnings forecast errors on a number of determinants, including litigation environment, industry concentration, firm financial performance and insider trading activities. They find evidence that the managers issue less optimistic or more pessimistic forecasts under litigation pressure. In summary, the evidence from the prior literature suggests that firms with litigation pressure tend to forecast less, and forecast more conservatively in content. If the managers are more conservative in disclosure tone when facing litigation pressure, there should be a weaker client risk effect (or stronger signal effect) for firms in a high litigation environment.

Prior literature (Pratt and Stice 1994; Krishnan and Krishnan 1997) document that auditors are sensitive to the litigation environment and also behave more conservatively under litigation pressure. Specifically, auditors tend to charge more fees, issue more going-concern opinions, and eventually may even resign from risky clients to protect themselves. By focusing on a size and industry matched sample, Seetharaman, Gul, and Lynn (2002) posit and finds that UK auditors charge a fee premium for UK firms cross-listed on US stock markets. In another study, Venkataraman, Weber and Willenborg (2008) observe that auditors charge a significant fee premium for pre-IPO engagements compared to post-IPO engagements. Moreover, Badertscher, Jorgesen, Katz and Kinney (2014) find that auditors charge a near 20% fee premium for the public firms as compared to private firms after controlling for size and other fee determinants. In summary, the audit fee premium for US cross listed UK firms, pre-IPO firms, and public firms is in line with the theory that auditors are sensitive to litigation risk change, and react by charging more fees to protect themselves. These evidence suggests a stronger client risk effect in a high litigation environment.

Overall, taking the managers' and auditors' behavior together, it is not clear how the tone fee relationship change with the litigation environment. Therefore, I state my second hypothesis as the following:

H2: The tone fee relationship is not moderated by high litigation environment.

2.3 *Information Environment and the Tone Fee Relationship*

Because the business operating cycle is continuous, current earnings and stock price certainly have information content about future earnings (Ball and Brown 1968). For the low earnings informativeness firms, mangers have superior information regarding the firm's future performance compared to external investors. Because of such information asymmetry, future earnings are not well reflected by the current stock price (or returns). Prior literature (Barry and Brown 1986; Merton 1987; Cheynel 2013) analytically studied the consequences of such information asymmetry, and found that investors will demand a premium for bearing such information risk, and that managers could lower the cost of external financing caused by this problem through the voluntary disclosure of related information (Signaling). These analytical implications are well supported by empirical results (Botosan 1997; Botosan and Plumlee, 2002; Easley and O'hara 2004;). More importantly, Muslu et al. (2014) find firms make more forward looking disclosures in the MD&A when their stock price poorly reflects future earnings information. These results support the hypothesis that managers use more forward-looking content in MD&A sections to mitigate the information risk when the earnings informativeness is low. As discussed earlier, the disclosure tone is informative about firms' future earnings, and is correlated with firms' future stock performance and analysts' earnings forecast revisions (Bryan 1997; Li 2008). Therefore, I conjecture that managers could also use disclosure tone as a tool to mitigate the information asymmetry problem when the earnings informativeness is low. Therefore, my next hypothesis predicts:

H3a: If the signal effect dominates, then the audit fees are more negatively associated with the disclosure tone in low earnings informativeness firms.

H3b: If the client risk effect dominates, then the audit fees are less positively associated with the disclosure tone in low earnings informativeness firms.

CHAPTER 3: EMPIRICAL DESIGN

The empirical design to examine whether auditors use qualitative information, such as the disclosure tone, in their pricing decisions includes the following steps: (1) select disclosure materials (or channels) to study the disclosure tone; (2) quantify the disclosure tone with positive and negative dictionaries from prior literature; (3) merge the tone data with the COMPUSTATA database for firm financial information, the Audit Analytics database for audit fees, auditor tenure, and audit industry specialist information, the I/B/E/S database for analyst earnings forecasts information, and the CRSP database for stock price information; and (4) run regression models with audit fees as the independent variable, the disclosure tone scores as the experiment variable, and reported numerical financial results and other necessary audit fee determinants as the control variables.

3.1 *Identifying the Subjects to Study the Disclosure Tone*

By focusing on the MD&A sections of annual financial reports, this study examines whether qualitative disclosure tone information has an impact on the pricing decisions of external auditors. In addition to SEC filings, a company could use a verity of channels to communicate with public investors, such as earnings press releases, conference calls, and so forth. Different from other modes of communication, the MD&A sections of the annual reports are required by the SEC to provide forward-looking information on known trends, demands, events, commitments, plans and

uncertainties that are reasonable likely to materially affect liquidity, capital resources or operations (SEC 1989, SEC 2003). As discussed in previous sections, such qualitative information could be used by auditors to understand more about their client business risk and litigation risk, and therefore impact the audit scope design and audit fees of the following fiscal year.[9] Appendix I provides examples of forward-looking statements excerpted from Intel Corporation's annual report for the fiscal year that ended on 12/31/2012. Muslu et al. (2014) document that there is considerate variation of forward-looking contents intensity across companies and industries. [10,11]

Furthermore, audit fees are determined around annual report filing events. The audit fee contract (i.e. the engagement letter) is typically approved in the same board meeting that approves the release of the financial results of previous year (Hackenbrack et al. 2013). The reason why I did not analyze the MD&A sections from quarterly financial reports (10-Qs) is because, the information there could be so old that auditors already adjusted their effort accordingly before the negotiation of next year audit fee contract starts.

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[9] Another possible reason why such qualitative information is valuable (to auditors): the quantitative voluntary forecast is not as popular as qualitative forward-looking statements. Krishnan et al (2012) documents that more than 60% of publicly traded US firm didn't voluntary forecast in the period between 2001 and 2006. Anilowski and Skinner (2007) finds similar results. Both studies use the first call (CIG) database, which focuses on quantitative forecasts.

[10] Forward-looking statements have an overlap scope with the audit fee contract (i.e. engagement letter). However, statements that are related with current year discontinued operations could also be informative to auditors for designing the upcoming fiscal year's audit scope. Therefore, this paper uses overall disclosure tone scores as an experimental variables.

[11] Muslu et al. (2014) document the forward-looking intensity, defined by the number of forward-looking sentences divided by the total number of sentences for a MD&A section, varies from 0% to 72%, and has mean (median) close to 13%.

3.2 *Quantifying the Disclosure Tone*

Following previous literature (Henry and Leone 2010; Rogers et al. 2011; Huang et al. 2014), I perform content analysis to quantify tone of MD&A sections with four specific positive and negative words dictionaries explained below. Specifically, I use Perl programs to match and count the positive and negative words found in each MD&A section. The tone score is measured as the count of positive words minus the count of negative words, scaled by the total words of that particular MD&A section (hereafter referred to as raw tone score).[12] Based on this definition, a larger value for such score corresponds to a more optimistic disclosure tone.

The four dictionaries used in this study to measure tone scores are as the following. The first one is the Harvard General Inquiry Index (*GI* hereafter), published by Harvard social psychologist Philip J. Stone. The second word list was obtained from a content analysis software package (Diction; *DI* hereafter), developed by University of Texas at Austin politics and mass media linguist Roderick P. Hart. In addition to these two general context analysis dictionaries, I also use financial reporting context-specific dictionaries developed by Elaine Henry (Henry 2006, 2008; *EH* hereafter), and Tim Loughran and Bill McDonald (Loughran and McDonald 2011;

[12] My results are similar if I use the positive words count plus the negative words count as the deflator. Tone scores are measured with the assumption of an equal weight on each word, regardless if it is identified as positive or negative. Henry and Leone (2010) studied the alternative word-frequency-inverse document frequency weighting (*wf-idf*) method, and their conclusion is that this commonly used method for information retrieval algorithms (e.g. Google) *cannot* be logically transferred to the measurement of tone in the context of financial disclosure. In addition, most prior studies, such as Davis et al. (2008), Demers and Vega (2008) and Kothari et al. (2009) all employ equal weighting method to measure the disclosure tone.

LM hereafter). Although Henry and Leone (2010) argue that the *EH* and *LM* dictionaries are more powerful than the *GI* and *DI* dictionaries in measuring qualitative information in the context of financial disclosure, Roger et al (2011) argue that the general context dictionaries have an advantage in capturing meaningful semantic variation in financial disclosures. Since it is not clear which dictionary is the best to address my research question, I measured the disclosure tone with all of them, and the results were found to be consistent across the four different tone measurements. To catch the maximum variations between the different tone measures, I use principal component analysis to construct a single factor (*TONE*) from the tone measurements based on different dictionaries.[13]

To decompose the tone into the part that is subject to a manager's discretion and the part that commensurate with a firm's performance, I run industry year regressions with the principal component factor (*TONE*) as dependent variable, and the tone determinants identified by prior research as independent variables (Li 2010, Huang et al. 2014). The residual parts of the regressions are defined as the abnormal part of the tone (hereafter referred to as *ABTONE*), and the predicted parts of these regressions are defined as the normal tone (hereafter referred to as *NTONE*). The detailed steps and variables used for decomposing are reported in Appendix II.

3.3 *Preparing the Sample*

[13] See Appendix A of Rogers et al. (2011) for a full comparison of four different wordlists used in this work.

For this study, I obtained the annual report header information of companies from EDGAR filings with a Perl program, the MD&A sections of annual reports downloaded from Noah Smith's website (i.e. Noah's ARK) at Carnegie Mellon University, historical financial data from COMPUSTAT, stock return information from CRSP, analyst forecast data from I/B/E/S, and audit related data from Audit Analytics. The MD&A data and audit fee data limit my sample period to 2000-2006. [14,15] I use a Perl Program to count the positive and negative words of each MD&A section, then I merge the tone data with the corresponding annual report header information (extracted from firm annual reports with a Perl program) to form my raw tone data.[16] After that, I merge the raw tone data with firm financial information data from COMPUTSTAT, historical stock price data from CRSP, financial analyst' earnings forecast data from I/B/E/S, and audit related data from Audit Analytics. Observations are eliminated from the sample if there are missing control variables in the decomposing tone model, or missing control variables in the audit fees model, or if the observations are from regulated industries, which are identified by the first 2 digits of the standard industry classification (SIC) code between 40 and 49, or if the observations are from financial industries (first 2 digits of the SIC code between 60 and 69).

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[14] The SAS tutorial examples on the WRDs.us website, developed by Johannes A Impink, are very helpful for downloading EDGAR filings and data management.

[15] The audit fees data start from 2000, which constrains me from studying tone-fees effects earlier than year 2000.

[16] This work also benefits from the Perl programs on Andrew Lenone's Website: Inkwellanalytics.com.

To mitigate the effect of potential outliers, all continuous variables are winsorized at the one percent and 99 percent levels before analysis. The final sample size is 6,708 firm-year observations from 2,146 firms. The sample selection procedure is reported in Table 2 Panel A.

<Insert Table 2 here>

The year and industry distribution of my sample is shown in Table 2 Panel B. Industries are classified by Fama-French 12 industry portfolios.[17] There is no industry and year clustering in the sample.

3.4 Regression Model

To test the association between my proxies for disclosure tone and the fees paid to auditors, I run the following regression model based on audit fee models from prior literature (Hay et al. 2006):

$$LAUDIT_t = \alpha_0 + \beta_0 DISCLOSURE\_TONE_{t-1} + \beta_1 LOGAT_t + \beta_2 BM_t + \beta_3 BUSY_t + \beta_4 ROA_t$$
$$+ \beta_5 QUICK_t + \beta_6 LEVERAGE_t + \beta_7 LOSS_t + \beta_8 INVREC_t$$
$$+ \beta_9 SPITEM_t + \beta_{10} NSEG_t + \beta_{11} FOPS_t + \beta_{12} BIGN_t$$
$$+ \beta_{13} GCM_t + \beta_{14} REPORT\_LAG_t + \beta_{15} TENURE_t + \beta_{16} EXPERT_t$$
$$+ \sum INDUSTRIES + \sum YEARS + \varepsilon_{jt}.$$

[17] The Fama-French industry portfolios definitions were obtained from their website: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/index.html
Note that financial and regulated industries are deleted from the sample, and durable and non-durable consumer goods are combined for illustration purposes in Table 2, Panel B.

The dependent variable (*LAUDIT*) is the natural log of fees (in 000s) paid to auditors for audit services.[18] *DISCLOSURE_TONE* is my disclosure tone metric, the primary experimental variable, including the prior year's *TONE_EH, TONE_LM, TONE_GI, TONE_DI, TONE,* and *ABTONE*, is calculated as described in section 3.2.[19] I expect a negative (positive) association between the prior year tone metric and current year audit fees if the signal (client risk) effect dominates the client risk (signal) effect".

Based on prior research, my audit fees model include the following common independent variable to control for audit effort. The natural log of total assets (*LOGAT*) measures for client firm size (Simunic 1980). The number of consolidated segments of the client firm (*NSEG*), the audit reporting lag in days, (*REPORT_LAG*), and an indicator variable of whether the company has foreign operation (*FOPS*) controls for the audit complexity (Ashbaugh et al. 2003). The proportion of total assets in inventory and accounts receivable (*INV_REC*) proxies the magnitude of high audit risk items (Hogan and Wilkins 2008). *SPITEM* is an indicator variable measuring whether the client firms report special items (Palmrose 1986). Auditee firm financial health are proxied by the return on assets (*ROA*), the indicator of the reporting negative earnings (*LOSS*), the debt level (*LEVERAGE*), the going concern

[18] To be consistent with Abbot (2003), Field et al. (2004), Mayhew and Wilikins (2003), and other previous studies, the natural log of audit fees in thousands of dollars is used as independent variables in this study.

[19] Following Defond and Zhang (2013), the experimental variables are the prior year's disclosure tone. Furthermore, the prior year's annual reporting filling and audit fee contract (engagement letter) are close in time.

opinion indicator (*GCM*), and the book to market ratio (*BM*) (Francis et al. 2005). Lastly, I include both national and city level auditor expertise (*EXPERT*), the number of years any auditor has served her specific client (*TENURE*), and an indicator variable of whether the auditor is one of the bigN auditors (*BIGN*) to control for auditor characteristics (Balsam et al. 2003; Reichelt and Wang 2010). Lastly, I include 13 industry and year dummies variables to control for industry and year fix effects (*INDUSTRIES*, *YEARS*) (Ashbaugh et al. 2003).[20] A detailed description of variable definitions is listed in Table 1.[21]

<Insert Table 1 here>

Two proxies of high litigation environment are used for this study. Following Francis et al. (1994) and Ajinkya et al. (2005), I set up a dummy variable (*LITIGATION*), which equals 1 for the high litigation industries subsample, and equals 0 otherwise. Another dummy variable (*SOX*), which is set to equal 1 for the post-SOX sample period, and equal 0 otherwise (Chen et al. 2012). The proxy of low earnings informativeness (*LOW_INFO*), equals 1 if the firm has low earnings response coefficient (ERC) than the sample median ERC, and equals 0 otherwise. The calculation details of ERC on the firm level is reported in Appendix III. To study the moderating effect of litigation environment (and earnings informativeness) on tone fee relationship, the interaction terms of the disclosure tone and the indicator variable

[20] Using alternative industry dummy variables defined by the fama-french 12 or 48 industry portfolios, or 2 digits SIC code, yield similar results as reported.

[21] Industry audit expert or Industry specialist auditor is defined on both the national and city (or the metropolitan statistical areas) levels following Reichelt and Wang (2010). Similar results are found if we use national or city level audit expert as a control variable in my regression model.

of high litigation environment (or low earnings informativeness) is added to our main regression. If the high litigation environment (or low earnings informativeness) is associated with a weaker client risk effect (or stronger signal effect), then I expect the coefficient on the interaction term of high litigation indictor and disclosure tone to be negative significant in the audit fee regressions, and *vice versa*.

CHAPTER 4: RESULTS

4.1 *Descriptive and Univariate Results*

Table 3 Panel A provides descriptive statistics for the sample. The mean of the raw tone scores (*TONE_EH, TONE_GI, TONE_DI*), the principle component of the four different dictionaries (*TONE*) and the normal tone (*NTONE*), are all positive. This is in line with the fact that usually the MD&A tone is optimistic. One exception is the mean of the raw tone score *TONE_LM* being negative. This is likely due to the *LM* dictionary having a much larger negative wordlist than its positive wordlist.[22] The mean of the abnormal tone (*ABTONE*) is zero by construction. The mean and median of all tone scores are quite close, suggesting that these variables are symmetrically distributed.

The mean audit fee is one million two hundred and seventy thousand dollars, which is a lot larger than the median audit fee of six hundred and fifteen thousand dollars. After the logarithm transformation, the mean and median of the audit fees (*LAUDIT*) are quite close. The natural logarithm transformation also helps reduce the difference between mean and median of the total assets. The mean *ROA* is -0.05, which suggest that many firms in my sample experienced poor performance during the sample years. Ninety-three percent of the sample firm years were audited by one of the big N auditors. This corresponds to the fact that large auditors dominate the

[22] The negative mean of *TONE_LM* is consistent with Loughran and McDonald (2011)'s mean score being negative for the annual reports sample.

American auditing market. Twenty-eight percent of sample firm years were audited by both national and city level industry specialists (*EXPERT =1*). On average the *REPORT_LAG* is 106 days. This is because my sample includes a lot of non-accelerated filing firms.[23]

<Insert Table 3 here>

Table 3, Panel B displays the correlation matrix for the variables in the regressions. In line with previous studies, the natural logarithm of total assets (*LAUDIT*) is positively correlated with the client size proxy (*LOG_AT*). The tone measurements are not correlated with *LAUDIT* in a consistent direction. Therefore I am not able to draw any preliminary inferences based on the correlations between the disclosure tone scores and audit fee variable. As expected, the principle component (*TONE*) of all the raw tone scores, the normal part of the tone (*NTONE*), and the abnormal part of the tone (*ABTONE*) are all highly correlated with the raw tone scores (*TONE_EH, TONE_GI, TONE_DI, TONE_LM*). However, *NTONE* and *ABTONE* are not correlated with each other because of the decomposing setup, i.e. the residual is orthogonal with independent variables. It is also worth noting that *NTONE* is correlated with a lot of variables, while the *ABTONE* is only very weakly correlated with some variables. This evidence suggests that the decomposing tone processes were successful in capturing the discretionary part of the tone in the *ABTONE* variable. The high correlation between *ABTONE* and *TONE* is likely due to the low

[23] The total asset mean (1,469 Million Dollars) is a lot larger than the total asset median (368 Million Dollars).

explaining power of tone determination models. Since the correlation coefficients are quite small between independent variables, the *VIF* scores from all regressions in this paper are less than four. Therefore, multicolinearity is unlikely to be an issue in this study.

I next split the sample by the median (0.00) of the discretional MD&A disclosure tone (*ABTONE*), and I conduct univariate tests comparing the means and medians of the descriptive statistics of the subsamples. The results from my univariate analyses suggest that firms with a more optimistic abnormal disclosure tone have lower audit fees, smaller book to market ratios, smaller quick ratios, less special items, less foreign operations, higher leverage ratios, and are audited more often by industry specialists. It is in line with hypothesis H1a (the signal effect dominates client risk effect) that optimistic disclosure firms have lower audit fees. I utilize multivariate regressions to further study the tone fee relationship in next section.

4.2 *Multivariate Regression Results*

I first analyze the tone fee relationship with the raw tone scores (*TONE_EH, TONE_GI, TONE_DI, TONE_LM*), and the principle component tone factor (*TONE*) as experimental variables in audit fee regression models. The results are summarized in Table 4. The regressions have a high-adjusted R-square value (0.81), which reconfirms the high explanatory power of audit fee models as reported in prior

literature.[24] All of the coefficients of the control variables are in the expected direction as the prior literature (Hay et al. 2006; Hay 2013). Year and industries dummy variables are included in the regressions however not reported, and standard errors are clustered on the firm level.[25]

In line with the fact that different wordlists capture different variations for the disclosure tone, the coefficients on the raw tone scores vary from model 1 to model 5. Particularly, *TONE_DI* seems weaker than the other three dictionaries in my research setting.[26] Despite the difference in magnitude, the coefficients of the raw tone scores and the principle component tone factor (*TONE*) are all negative significant ($p=0.02$ for *TONE_DI*, and $p<0.00$ for other tone scores). If the overall disclosure tone is considered as discretional, then the negative associations between favorable disclosure tone scores and audit fees as reported in Table 4 suggest that the signal effect dominates the client risk effect in the sample.

<Insert Table 4 here>

Huang et al. (2014) argues that the disclosure tone has two components: one part is the tone determined by firm performance or economic fundamental (normal tone, or *NTONE*), the other part is the tone that reflects the discretion of managers in disclosure (abnormal tone, or *ABTONE*). Following this work, I decompose the

[24] Audit fee models are well specified and usually have high-adjusted R-Square values. For example, Chang et al (2010) has adjusted R-Square 0.79 in their fee regressions. Krishnan et al. (2011) has adjusted R-square 0.79 and 0.81 in their fee regressions.

[25] The results stay similar if standard errors are clustered on the firm level (Krishnan et al. 2013), or are clustered on both firm and year levels (Petersen 2009; Gow et al. 2010).

[26] Whether or not it include *Tone_DI* in the principle analysis, the results do not change.

overall tone (*TONE*) into the normal tone (*NTONE*) and the abnormal tone (*ABTONE*) (see Appendix II for detailed procedures for decomposing). I next examine the tone fee relationship for the abnormal tone (*ABTONE*) with (or without) the normal tone (*NTONE*) as a control variable. The results are reported in Table 5.

<Insert Table 5 here>

Since the normal tone (*NTONE*) refers to the part of tone that commensurates with firm current and future performance, it is not surprising to find the coefficient normal tone (*NTONE*) are negative and significant ($p<0.00$) as reported in model 1 and model 3 of Table 5, which indicate a strong signal effect associated with the normal tone. I also find that the coefficient of the abnormal tone (*ABTONE*) are negative and significant ($p<0.00$) in audit fee determination regression results as reported model 2 and model 3 of Table 5. This evidence further confirms that the signal effect dominates the client risk effect in my sample. Therefore, hypothesis H1a, the signal effect is dominating, is supported (and hypothesis H1b, the client risk effect is dominating, is not supported) by the results presented in Table 5. At the same time, the negative association between tone and fees also implies that auditors view an optimistic disclosure tone as a signal of good future performance and of lower audit risk, and charge lower fees to firms disclosing with a favorable tone. A one standard deviation change of *ABTONE* increase is associated with about $50,000 saving in audit fees. More importantly, this evidence also suggests that qualitative information is impounded into audit fees. To my knowledge, this is the first empirical evidence

about whether auditors use qualitative disclosure information in the audit pricing decisions.

Next, I test whether the litigation environment could moderate the tone-fees relationship (hypothesis 2). Specifically, I test whether the tone-fees relationship is stronger or weaker in different litigation environments: cross-sectional in different industries, and cross-sectional pre and post-SOX sample periods. The test results are reported in Table 6.

<Insert Table 6 here>

Following Francis et al. (1994) and Ajinkya et al. (2005), I classify sample firms into high litigation industries and low litigation industries using the SIC code from COMPUSTAT. Table 6 reports the test results of the tone fee relationship across high litigation pressure industries and low litigation exposure industries. The coefficient of the indicator of high litigation industries is positive and significant ($p = 0.00$). This result is in line with the results found by Seetharaman, Gul and Lynne (2002), which suggest that auditors charge a fee premium for firms facing higher litigation risk. The coefficient of the interaction term of a high litigation industry and the abnormal tone is negative and significant ($p=0.01$). This evidence is consistent with the prior evidence that managers are more conservative in disclosure when they are exposed to high litigation pressure. Since this result suggests that signal effect is stronger (or client risk effect is weaker) under the greater litigation pressure, my

hypothesis H2, the tone fees relationship doesn't change across industries, is rejected by the Table 6 result.

<Insert Table 7 here>

Prior literature (e.g. Wang 2010) also suggests that publicly traded companies face greater litigation pressure in the post-SOX period as compared to the pre-SOX period. Table 7 reports my test results of the tone fee relationship across the pre-SOX period and the post-SOX period. The coefficient of the SOX indicator is positive and significant (p=0.00). This finding is consistent with the results found by Ghosh and Pawlewicz (2009), which suggest that auditors charge a fee premium due to the additional audit effort required in post-SOX period. The coefficient of the interaction term of the post-SOX indictor and the abnormal tone is not significant (p=0.38). This result suggests that the tone fee relationship did not change from the pre-SOX period to the post-SOX period. Therefore, the hypothesis H2 is not rejected by Table 7 evidence.

<Insert Table 8 here>

Lastly, I examine whether earnings informativeness could strengthen the association between audit fees and disclosure tone. Table 7 reports the results of the earnings informativeness moderating effect on the tone fee relationship. The coefficient on the low earnings informativeness indicator is positive and significant (p=0.02). This evidence is in line with the results found by Su, Siridihi and Gul (2007), which suggest that auditors charge a fee premium for to low earnings

informativeness firms. The interaction term of low earnings informativeness and an abnormal disclosure tone is negative, however not significant (p=0.64). Therefore, hypothesis H3a is not supported by the results in this table, and H3b is not tested since the signal effect dominates in my sample. The interaction term is not significant could be due to the fact that disclosure tone is changing from year to year, however my proxy of earnings informativeness is based on a rolling window of the prior 16 fiscal quarters. It is a limitation that my earnings informativeness proxy is calculated based on such a longer horizon, which could average out the change of informativeness from year to year. I got similar results using ERC calculated based on a 12 fiscal quarters rolling window. An earnings informativeness on the firm-year level could be better proxy for this hypothesis test.

4.3 *Additional Tests*

There are a number of alternative explanations for my results. Firstly, auditors may lower audit fees because of competition from other auditors when their clients disclose in a favorable tone. Since industry specialists have a competitive advantage compared to non-expert auditors, the tone fee relationship should be stronger in the non-expert auditors' subsample compared to the audit experts' subsample.[27] I did not find any tone fee relationship difference between these two subsample (results are not reported). These results imply that tone fee relationship is not competition driven.

[27] The audit experts, or industry specialists, are known to invest heavily in sophisticated auditing technologies and accrue a significant amount of experience in using such technologies in practice.

Secondly, Huang et al. (2014) provides evidence that investors are deceived by the abnormal tone in a press releases disclosure tone sample. Are auditors also deceived by the MD&A disclosure tone by giving fee discount? Assuming that auditors understand the behavior of their clients' to a deeper degree over time, then fee discounts should be smaller as auditor tenure length increases. I did not find any difference in tone fee relationship across the subsamples defined by auditor tenure length longer than or less than three years (results are not reported). To some extent, these results preclude the possibility that the tone fee relationship is a phenomenon that only exists during the early stages of auditor-client engagement or the later stage of audit-client engagements. The results stay similar (not reported) if I delete the auditor tenure equals 1 year observations.

Previous literature also suggests that there is a nonlinear relationship between audit fees and client size (Baber et al. 1987, Rubin 1987). To control for such nonlinearity, we repeat my regression analysis including the $(LOGAT)^2$ term,[28] and the results stay similar to reported results. Further regression analysis in both subsamples divided by the mean or median of the natural log of total assets also yield similar results.

Lastly, my results are robust when performance matched discretionary accruals (Kothari et al. 2005), or when the absolute values of the discretionary accruals are included as additional control variables in the regression. This suggests that the tone fee relationship is stable after controlled for the potential earnings

[28] Both *LOGAT* and square of $LOGAT^2$ are positive significant ($p<0.00$) in the audit fees regressions.

management activities of managers. The results stay similar as the reported after I control the corporate governance by the independent board member ratio in the regressions.

CHAPTER 5: CONCLUSION

Simunic's (1980) analytical model suggests that rational auditors should incorporate any information related to engagement risk into their pricing decisions. Using the risk factors derived from reported financial numbers, prior audit pricing literature finds consistent evidence for this theory (e.g. Simunic 1980; Palmrose 1986; Crashwell et al 1995; Abbot 2003; Reynolds et al. 2004; Antle et al. 2006; Chang et al. 2010; Defond and Zhang 2012). Extending this line of research, this work examines whether the qualitative information content in the MD&A sections of annual reports, such as disclosure tone, has any impact on audit pricing after controlling for the traditional client risk factors derived from numerical financial results.

Unlike other disclosure channels, MD&A sections are required by the SEC to include forward-looking qualitative information about known trends, demands, events, commitments, plans and uncertainties that are reasonably likely to materially affect liquidity, capital resources or operations (SEC 1989, SEC 2003). I conjecture that the qualitative disclosure information could be useful for auditors for their pricing decisions because they could be indicators of both lower client business risk and higher litigation risk.

The disclosure tone of MD&A sections are quantified with a Perl program by counting the frequency of positive and negative words based on dictionaries developed by prior literature (Stone et al. 1966; Hart 2000; Henry 2008; Loughran and McDonald 2011). I empirically explore whether and how the disclosure tone

impacts the pricing decisions of auditors by regressing the natural log of audit fees on common fee determinants and the disclosure tone scores as the experimental variable.

I find that the coefficients of optimistic disclosure tone scores are negatively significant in my multivariate audit fee models. This empirical evidence implies that qualitative information has an impact on the audit pricing decisions, and that auditors generally view an optimistic disclosure tone as a signal of lower client business risk. Further analysis shows that the association between tone and audit fees is stronger in high litigation environment.

This work expands on knowledge established by prior literature at least in the following two ways. Prior literature provides evidence that auditors use risk related public numerical information, and private information in audit pricing decisions (Pratt and Stice 1994; Johnstone and Bedard 2001; Stanley 2011; Picconi and Reynolds 2013; Hackenbrack et al. 2013). By linking disclosure tone literature and audit pricing literature, this work contributes to audit fee information content literature with the evidence that qualitative information play an important role in audit pricing decisions.

Moreover, this work also contributes to research on the economic consequences of qualitative disclosure properties. A growing literature studies how investors and financial analysts' react to disclosure tone. Kothari et al. (2009) find that favorable tone disclosure is associated with a number of desirable economic consequences, such as the decreased cost of capital, lower stock return volatility, and higher analyst forecast accuracy. A number of other studies (Feldman et al. 2008; Li

2010; Loughran and McDonald 2011; Davis et al. 2012) find that the optimistic tone is correlated with positive stock price responses to disclosure events. In summary, this literature supports the idea that an optimistic tone is a lower firm risk. This paper extends this literature by providing evidence that an optimistic disclosure tone is an indicator of lower audit risk, which correlates with lower audit fees.

Lastly, a number of limitations and some future work are discussed here. First, the sample period is limited to 2000 to 2006 by the audit fee data and the MD&A data (from the Noah's ark website). This sample period limits me from studying the tone fee relationship for the post financial crisis period. It could be beneficial to extract the MD&A sections from the recent annual reports and expand the sample period range in the future. Second, this paper focuses on the MD&A sections of annual reports, because managers are required by the SEC to disclose forward-looking information. It is worth noting that some other modes of disclosure, such as, press releases, and earnings conference calls, may also include voluntarily disclosed forward-looking information. Such an information set could also be used by auditors to evaluate engagement risks and therefore impact pricing as well as the disclosure tone information from MD&A in 10-K reports. By focusing on information sets from modes of disclosure other than the MD&A disclosure tone, future studies could find additional evidence of tone fee relationship. Thirdly, this paper focuses on the disclosure tone of MD&A sections, which becomes public information after the filling events of annual reports. Future research could investigate the private qualitative

information shared between managers and auditors. How such information impacts audit pricing could be a new contribution to audit fee information content literature.

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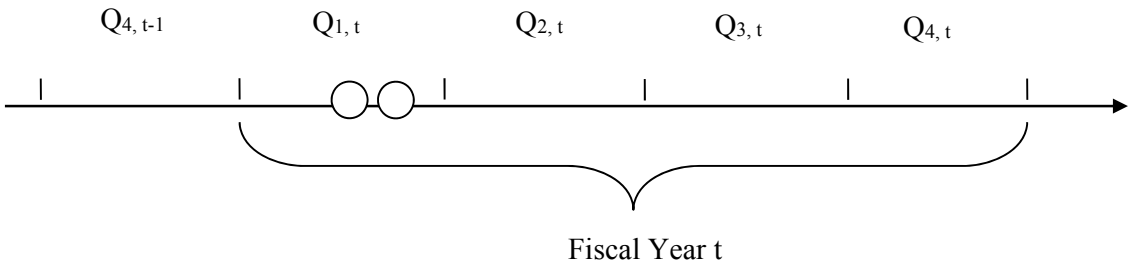
Figure 1

Timeline of Setting Audit Fees



Notes: The two circles in the first quarter of fiscal year *t* represent the following two events. One represents that the audit fee contract (i.e. engagement letter), is signed by the proper parties and becomes effective. Another one represents that the release of the prior year's earnings or the annual report filling event. The engagement letter and the release of earnings are typically approved by the same board meeting (Hackenbrack et al. 2005; Hackenbrack et al. 2013). The purpose of having two separate circles is to show two ongoing events in the first quarter, and is not intended to show that one is happening early than the other event.

Table 1

Variable Definitions

Dependent Variables		
AUDFEE	=	Audit fees in thousands of dollars. Calculated by the variable AUDIT_FEES from Audit Analytics divided by 1000;
LAUDIT	=	Natural log of audit fees in thousands of dollars. Calculated by natural log of AUDFEE;
Experimental Variables		
TONE_LM	=	Disclosure tone of MD&A sections measured by the LM dictionary (Loughran and McDonald 2011);
TONE_EH	=	Disclosure tone of MD&A sections measured by the EH dictionary (Henry 2006, 2008);
TONE_GI	=	Disclosure tone of MD&A sections measured by Harvard General Index dictionary(Stone et al. 1966);
TONE_DI	=	Disclosure tone of MD&A sections measured by the dictionary extracted from the Diction software(Hart 2000);
TONE	=	Principle component of LM, EH, GI, DI tone. Calculated by the SAS principle component analysis procedure;
ABTONE	=	Abnormal Tone, or the part of the disclosure tone subject to a manager's discretion;
NTONE	=	Normal tone, or the part of the disclosure tone commensurate with firm performance;

Table 1

Variable Definitions - Continued

Control Variables		
ASSET	=	Total assets in millions of dollars;
LOGAT	=	Natural log of total assets;
BM	=	Book-to-market ratio;
BUSY	=	1 if the fiscal year end is December, and 0 otherwise;
ROA	=	Income before extraordinary items deflated by total assets;
QUICK	=	Current assets divided by current liabilities;
LEVERAGE	=	Total debts deflated by total assets;
LOSS	=	1 if the firm reports a loss for the current year, and 0 otherwise;
INV_REC	=	Sum of inventories and receivables, divided by total assets;
SPITEM	=	1 if the firm reports a special item, and 0 otherwise;
BIGN	=	1 if the firm is audited by a big5 audit firm, and 0 otherwise;
NSEG	=	The number of business segments;
FOPS	=	1 if the firm has a foreign operation, and 0 otherwise;
GCM	=	1 if the firm receives a going concern opinion, and 0 otherwise;
REPORT_LAG	=	Time in days from fiscal year end to the audit report date;
EXPERT	=	1 if an auditor is both a national and city level expert, 0 otherwise;
TENURE	=	Number of years for a client to be served by a specific auditor;

SOX	=	1 if the fiscal year is larger than 2003, and 0 other wise;
LITIGATION	=	1 for high litigation industry firms (SIC codes between 2833-2836, 3570-3577, 3600-3674,5200-5961 and 7370), and 0 otherwise;
LOW_INFO	=	1 for low earnings informativeness firms, 0 otherwise, see Appendix III for details;
SOX_ABTONE	=	Interaction between ABTONE and SOX;
LITI_ABTONE	=	Interaction between ABTONE and LITIGATION;
LOWINFO_ABTONE	=	Interaction between ABTONE and LOW_INFO;

Table 2

Panel A: Sample Construction Procedure

Noah's Ark MD&A firm year observations (2000-2006)	24,173
Less	
Missing Compustat information	(9,013)
Missing CRSP information	(2,754)
Missing I/B/E/S information	(3,950)
Missing Audit Analytics information	(1,748)
Disclosure Tone and Audit Fees Sample	6,708

The MD&A sections of annual reports were downloaded from Noah Smith's website (i.e. Noah's ARK) at Carnegie Mellon University. After deleting regulated industries observations (SIC code 40-49), and financial industries observations (SIC code 60-69), I have 24,173 firm year observations. More observations were removed from the sample if they were missing historical financial data from COMPUSTAT, stock return information from CRSP, analyst forecast data from I/B/E/S, or audit related data from Audit Analytics. The MD&A data from Noah's ARK and the Audit fee data from Audit Analytics limit my sample period to 2000 to 2006. Perl Programs with specific dictionaries are used to count the positive, the negative, and the total words of each MD&A section to decide the tone scores for each MD&A section. The final tone fee sample has 6,708 firm year observations.

Table 2

Panel B: Sample Year and Industry Distribution

Year	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	Total
2000	38	57	22	11	150	49	91	66	484
2001	57	67	23	9	248	86	118	85	693
2002	54	72	27	12	301	98	127	82	773
2003	78	132	44	25	392	113	202	104	1,090
2004	94	145	51	36	408	155	214	120	1,223
2005	99	143	51	37	393	151	210	130	1,214
2006	102	145	62	39	370	170	213	130	1,231
Total	622	761	280	169	2,262	822	1,175	717	6,708

Industries are classified following Fama-French 12 industry portfolios: (1) Consumer Goods, including both durable and non-durable consumer goods industries; (2) Manufacturing, including machinery, trucks, planes, office furniture, paper production, and printing industries; (3) Energy, including oil, gas, and coal extraction and allied production industries (4) Chemical and allied product industries; (5) Business equipment, including computer, software and electronic industries; (6) Wholesale, retail, laundries and repair shops and related industries; (7) Heath care, medical instrument and drugs; (8) Other industries, including mines, construction, building management, transportation, hotels, entertainment. Detailed portfolios definition are available from Kenneth French's websites. [29] There are no industry and year clustering in the sample.

[29] http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/index.html

Table 3: Panel A: Descriptive Statistics (N = 6,708)

Variable Name	Mean	Median	Standard Deviation	25th percentile	75th percentile
AUDFEE	1,270.91	615.00	2,345.30	268.00	1,363.50
LAUDIT	6.44	6.42	1.14	5.59	7.21
TONE_LM	-0.27	-0.30	0.22	-0.43	-0.14
TONE_EH	0.31	0.31	0.21	0.18	0.46
TONE_GI	0.23	0.23	0.12	0.15	0.31
TONE_DI	0.18	0.18	0.22	0.04	0.32
TONE	0.05	0.03	0.99	-0.64	0.71
NTONE	0.05	0.08	0.47	-0.24	0.39
ABTONE	0.00	-0.03	0.85	-0.60	0.55
ASSETS	1,469.88	368.05	3,510.88	122.16	1103.29
LOGAT	5.96	5.91	1.59	4.81	7.01
BM	0.52	0.41	0.52	0.25	0.65
BUSY	0.68	1.00	0.47	0.00	1.00
ROA	-0.05	0.03	0.25	-0.06	0.08
QUICK	2.82	1.86	2.87	1.13	3.35
LEVERAGE	0.41	0.40	0.22	0.23	0.56
LOSS	0.35	0.00	0.48	0.00	1.00
INV_REC	0.28	0.25	0.20	0.12	0.39
SPITEM	0.68	1.00	0.47	0.00	1.00
BIGN	0.93	1.00	0.26	1.00	1.00
NSEG	2.13	1.00	1.53	1.00	3.00
FOPS	0.59	1.00	0.49	0.00	1.00
GCM	0.02	0.00	0.13	0.00	0.00
REPORT_LAG	105.36	101.00	43.57	87.00	115.00
TENURE	8.97	7.00	6.63	5.00	12.00
EXPERT	0.28	0.00	0.45	0.00	1.00

Panel B: Correlation among Variables of Interest – Pearson (below)/ Spearman (above)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) LAUDIT	1	**-0.10**	**0.04**	**-0.03**	**0.18**	**0.02**	**0.14**	**-0.05**	**0.72**	**-0.07**	**-0.04**	**0.26**
(2) TONE_LM	**-0.11**	1	**0.45**	**0.37**	**0.40**	**0.76**	**0.37**	**0.67**	**0.03**	**-0.10**	**0.03**	**0.14**
(3) TONE_EH	**0.04**	**0.46**	1	**0.31**	**0.38**	**0.74**	**0.48**	**0.53**	**0.19**	**-0.12**	0.02	**0.22**
(4) TONE_GI	**-0.03**	**0.37**	**0.32**	1	**0.33**	**0.66**	**0.24**	**0.55**	**0.03**	**-0.13**	0.01	**0.02**
(5) TONE_DI	**0.19**	**0.40**	**0.38**	**0.33**	1	**0.70**	**0.31**	**0.60**	**0.23**	**-0.07**	0.01	**0.20**
(6) TONE	**0.03**	**0.77**	**0.74**	**0.68**	**0.72**	1	**0.48**	**0.73**	**0.13**	**-0.14**	**0.03**	**0.19**
(7) NTONE	**0.16**	**0.37**	**0.51**	**0.37**	**0.38**	**0.48**	1	0.01	**0.26**	**-0.18**	0.00	**0.45**
(8) ABTONE	**-0.04**	**0.69**	**0.55**	**0.57**	**0.62**	**0.76**	0.01	1	0.00	**-0.06**	**0.02**	**-0.01**
(9) LOGAT	**0.78**	0.01	**0.18**	**0.03**	**0.24**	**0.16**	**0.27**	0.00	1	-0.01	**-0.07**	**0.36**
(10) BM	**-0.19**	**-0.03**	**-0.10**	**-0.06**	**-0.07**	**-0.11**	**-0.19**	0.01	**-0.06**	1	**-0.09**	**-0.22**
(11) BUSY	**-0.04**	**0.02**	**0.05**	0.01	0.01	0.02	0.01	0.01	**-0.06**	**-0.05**	1	**-0.08**
(12) ROA	**0.26**	**0.06**	**0.12**	**-0.04**	**0.14**	**0.10**	**0.15**	**-0.05**	**0.39**	-0.01	**-0.09**	1
(13) QUICK	**-0.25**	**0.03**	**-0.05**	**0.04**	**-0.17**	**-0.05**	0.00	**-0.04**	**-0.17**	**-0.06**	**0.02**	**-0.12**
(14) LEVERAGE	**0.28**	**0.02**	**0.03**	**0.07**	**0.17**	**0.09**	**0.10**	**0.11**	**0.27**	**-0.08**	**0.06**	-0.01
(15) LOSS	**-0.26**	**-0.11**	**-0.17**	-0.02	**-0.20**	**-0.17**	**-0.23**	0.01	**-0.36**	**0.13**	**0.07**	**-0.62**
(16) INV_REC	**0.06**	**0.07**	**0.04**	-0.02	-0.01	**0.03**	-0.01	0.00	-0.01	**0.11**	**-0.11**	**0.32**
(17) SPITEM	**0.30**	**-0.11**	**-0.03**	**-0.09**	0.02	**-0.07**	**-0.08**	**-0.03**	**0.23**	**0.04**	0.00	**-0.05**
(18) NSEG	**0.35**	-0.01	**0.03**	**-0.04**	**0.08**	**0.02**	**0.03**	0.01	**0.36**	0.02	0.00	**0.18**
(19) FOPS	**0.44**	**-0.07**	-0.01	**-0.15**	-0.01	**-0.08**	**-0.13**	**-0.04**	**0.44**	**-0.06**	**-0.06**	**0.26**
(20) GCM	**-0.06**	**-0.04**	**-0.05**	0.02	**-0.05**	**-0.04**	**-0.09**	0.02	**-0.18**	0.01	0.02	**-0.31**
(21) REPORT_LAG	**-0.08**	-0.02	**0.03**	**0.04**	**-0.06**	0.00	-0.02	0.01	**-0.16**	**0.03**	0.00	**-0.12**
(22) BIGN	**0.13**	**0.04**	**0.05**	-0.02	**0.05**	0.02	0.01	0.01	**0.18**	**-0.08**	**0.06**	0.00
(23) EXPERT	**0.17**	**0.02**	0.01	**0.03**	**0.06**	**0.04**	**0.05**	**0.03**	**0.19**	**-0.02**	0.00	**0.07**
(24) TENURE	**0.25**	**0.07**	0.00	**0.03**	**0.07**	**0.06**	**0.11**	0.00	**0.28**	**-0.04**	**-0.08**	**0.12**

Variables	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
(1) LAUDIT	**-0.28**	**0.28**	**-0.26**	**0.11**	**0.27**	**0.31**	**0.49**	**-0.09**	**-0.17**	**0.26**	**0.19**	**0.21**
(2) TONE_LM	**-0.05**	**0.03**	**-0.13**	**0.07**	**-0.14**	-0.02	**-0.06**	**-0.04**	**-0.05**	**0.05**	**0.03**	**0.06**
(3) TONE_EH	**-0.12**	**0.05**	**-0.18**	**0.05**	**-0.03**	**0.03**	-0.01	**-0.06**	**0.03**	**0.04**	0.01	-0.01
(4) TONE_GI	**-0.07**	**0.07**	-0.02	**-0.04**	**-0.09**	**-0.05**	**-0.15**	0.01	0.01	-0.02	**0.03**	**0.04**
(5) TONE_DI	**-0.27**	**0.19**	**-0.20**	0.01	0.02	**0.07**	-0.01	**-0.05**	**-0.08**	**0.05**	**0.05**	**0.05**
(6) TONE	**-0.17**	**0.11**	**-0.18**	**0.04**	**-0.09**	0.01	**-0.08**	**-0.04**	**-0.02**	**0.04**	**0.04**	**0.05**
(7) NTONE	**-0.16**	**0.05**	**-0.22**	**-0.02**	**-0.08**	**0.02**	**-0.14**	**-0.08**	**-0.03**	0.01	**0.04**	**0.09**
(8) ABTONE	**-0.12**	**0.06**	-0.01	**0.05**	**-0.03**	0.00	0.00	**0.02**	-0.00	0.00	**0.03**	0.01
(9) LOGAT	**-0.33**	**0.27**	**-0.39**	0.00	**0.27**	**0.32**	**0.44**	**-0.17**	**-0.28**	**0.32**	**0.19**	**0.26**
(10) BM	**-0.10**	**-0.09**	**0.06**	**0.13**	**0.07**	**0.09**	0.01	-0.01	**0.05**	**-0.03**	0.01	-0.01
(11) BUSY	**0.03**	**0.05**	**0.07**	**-0.12**	0.00	-0.01	**-0.06**	**0.02**	**0.05**	0.02	**-0.02**	**-0.11**
(12) ROA	**-0.11**	**-0.03**	**-0.14**	**0.32**	**-0.12**	**0.14**	**0.23**	**-0.18**	**-0.19**	0.01	**0.07**	**0.12**
(13) QUICK	1	**-0.70**	**0.15**	**-0.33**	**-0.10**	**-0.24**	**-0.09**	**-0.07**	**0.08**	**0.08**	**-0.09**	**-0.05**
(14) LEVERAGE	**-0.50**	1	**-0.05**	**0.21**	**0.16**	**0.23**	**0.12**	**0.06**	**-0.08**	0.00	**0.09**	**0.03**
(15) LOSS	**0.19**	0.00	1	**-0.32**	**0.10**	**-0.17**	**-0.23**	**0.18**	**0.17**	**-0.04**	**-0.09**	**-0.11**
(16) INV_REC	**-0.34**	**0.20**	**-0.28**	1	**-0.04**	**0.19**	**0.18**	**-0.07**	**-0.04**	**-0.14**	**0.03**	**0.06**
(17) SPITEM	**-0.13**	**0.16**	**0.10**	**-0.08**	1	**0.14**	**0.21**	**0.02**	**-0.04**	**0.11**	-0.01	**0.04**
(18) NSEG	**-0.22**	**0.23**	**-0.17**	**0.10**	**0.14**	1	**0.23**	**-0.05**	**-0.11**	0.01	**0.06**	**0.09**
(19) FOPS	**-0.18**	**0.11**	**-0.23**	**0.13**	**0.21**	**0.25**	1	**-0.11**	**-0.11**	**0.16**	-0.00	**0.12**
(20) GCM	**-0.06**	**0.07**	**0.18**	**-0.06**	**0.02**	**-0.05**	**-0.11**	1	**0.07**	-0.02	-0.02	**-0.04**
(21) REPORT_LAG	**0.02**	**-0.01**	**0.13**	**-0.03**	0.01	**-0.05**	**-0.07**	**0.07**	1	**-0.11**	**-0.11**	**-0.14**
(22) BIGN	**0.02**	0.00	**-0.04**	**-0.15**	**0.11**	**0.05**	**0.16**	-0.02	**-0.06**	1	**0.17**	**0.22**
(23) EXPERT	**-0.06**	**0.09**	**-0.09**	**0.02**	0.02	**0.06**	0.01	-0.02	**-0.06**	**0.22**	1	**0.09**
(24) TENURE	**-0.06**	**0.09**	**-0.14**	**0.04**	**0.07**	**0.14**	**0.15**	**-0.04**	**-0.10**	**0.27**	**0.11**	1

Table 3

Panel C: Sample Univariate Analysis

	ABTone_Small Sample (3,354 obs)			**ABTone_Large Sample (3,354 obs)**			**T-test**	**Wilconox**
	Mean	Median	STD	Mean	Median	STD	Mean	Median
LAUDIT	6.53	6.54	1.14	6.39	6.35	1.17	0.14***	0.19***
TONE	-0.64	-0.57	0.72	0.72	0.69	0.73	-1.36***	-1.26***
ABTONE	-0.68	-0.58	0.52	0.67	0.55	0.53	-1.35***	-1.13***
NTONE	0.04	0.10	0.49	0.04	0.10	0.51	0.00	0.00
LOGAT	6.03	5.95	1.64	5.99	5.92	1.66	-0.04	0.03
BM	0.52	0.43	0.50	0.52	0.39	0.63	0.00	0.04***
BUSY	0.66	1.00	0.47	0.69	1.00	0.46	-0.03***	0.00***
ROA	-0.05	0.03	0.33	-0.07	0.03	0.37	0.02**	0.00
QUICK	2.86	1.93	2.82	2.70	1.65	3.20	0.16*	0.28***
LEVERAGE	0.41	0.38	0.23	0.44	0.42	0.22	-0.03***	-0.04***
LOSS	0.34	0.00	0.47	0.35	0.00	0.48	0.01	0.00
INV_REC	0.28	0.24	0.20	0.28	0.25	0.21	0.00	-0.01
SPITEM	0.70	1.00	0.46	0.66	1.00	0.48	0.04***	0.00***
NSEG	2.18	1.00	1.57	2.16	1.00	1.55	0.02	0.00
FOPS	0.62	1.00	0.49	0.54	1.00	0.50	0.08***	0.00***
BIGN	0.93	1.00	0.26	0.93	1.00	0.25	0.00	0.00
GCM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00**
REPORT_LAG	105.66	101.00	44.72	106.05	101.00	47.24	0.39	0.00
TENURE	9.01	7.00	6.68	9.16	7.00	6.83	0.14	0.00
EXPERT	0.28	0.00	0.45	0.30	0.00	0.46	-0.02**	0.00**

Table 4

Testing the Association between Audit Fees and Disclosure Tone
(Raw Disclosure Tone Scores)

Variables	Predicted Sign	Model 1	Model 2	Model 3	Model 4	Model 5
INTERCEPT	?	1.95***	2.02***	2.04***	1.99***	1.98***
TONE_LM	?	-0.32***				
TONE_EH	?		-0.15***			
TONE_GI	?			-0.28***		
TONE_DI	?				-0.08**	
TONE	?					-0.06***
LOGAT	+	0.45***	0.45***	0.45***	0.45***	0.46***
BM	-	-0.05***	-0.05***	-0.05***	-0.05***	-0.05***
BUSY	+	0.09***	0.08***	0.08***	0.08***	0.08***
ROA	-	-0.39***	-0.32***	-0.33***	-0.32***	-0.32***
QUICK	-	-0.03***	-0.04***	-0.03***	-0.04***	-0.03***
LEVERAGE	+	0.20***	0.17***	0.18***	0.18***	0.18***
LOSS	+	0.08***	0.09***	0.09***	0.08***	0.08***
INV_REC	+	0.19***	0.17***	0.17***	0.17***	0.17***
SPITEM	+	0.11***	0.12***	0.12***	0.12***	0.11***
NSEG	+	0.05***	0.05***	0.05***	0.05***	0.05***

FOPS	+	0.27***	0.28***	0.28***	0.28***	0.27***
BIGN	+	0.30***	0.29***	0.29***	0.30***	0.29***
GCM	+	0.14***	0.13***	0.14***	0.14***	0.14***
REPORT_LAG	+	0.00***	0.00***	0.00***	0.00***	0.00***
TENURE	+	0.00**	0.00*	0.00**	0.00**	0.00**
EXPERT	+	0.09***	0.09***	0.08***	0.09***	0.09***
Industry Dummies		*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Year Dummies		*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
N		6,708	6,708	6,708	6,708	6,708
Adjusted R^2		0.812	0.810	0.809	0.809	0.811

The multivariate regression results reported in table 4 are based on the following model:

$$LAUDIT_t = \alpha_0 + \beta_0 DISCLOSURE\_TONE_{t-1} + \beta_1 LOGAT_t + \beta_2 BM_t + \beta_3 BUSY_t + \beta_4 ROA_t$$
$$+ \beta_5 QUICK_t + \beta_6 LEVERAGE_t + \beta_7 LOSS_t + \beta_8 INVREC_t$$
$$+ \beta_9 SPITEM_t + \beta_{10} NSEG_t + \beta_{11} FOPS_t + \beta_{12} BIGN_t$$
$$+ \beta_{13} GCM_t + \beta_{14} REPORT\_LAG_t + \beta_{15} TENURE_t + \beta_{16} EXPERT_t + \varepsilon_{jt}.$$

Where the dependent variable (*LAUDIT*) is the natural log of fees (in 000s) paid to auditors for audit services. *DISCLOSURE_TONE* is the disclosure tone metric, the experimental variable, including prior year *TONE_EH*, *TONE_LM*, *TONE_GI*, *TONE_DI* and *TONE* calculated as described in section 3.2. For the definition of the control variables, please refer to Table 1. *,**,*** represent significance levels of 10 percent, 5 percent, and 1 percent, respectively. Following Krishnan et al. (2013), the standard errors are clustered by firm identifiers (gvkey). Similar results are found if standard errors are clustered with both firm identifiers and fiscal year (Petersen 2009 and Gow et al 2010).

Table 5

Testing the Association between Audit Fees and Disclosure Tone (Abnormal Tone: H1a and H1b)

Variables	Predicted Sign	Model 1	Model 2	Model 3
INTERCEPT	?	2.02***	2.04***	3.29***
ABTONE	?		-0.03***	-0.04***
NTONE	?	-0.18***		-0.19***
LOGAT	+	0.45***	0.45***	0.45***
BM	-	-0.06***	-0.04***	-0.04***
BUSY	+	0.09***	0.08***	0.10***
ROA	-	-0.31***	-0.33***	-0.30***
QUICK	-	-0.03***	-0.04***	-0.04***
LEVERAGE	+	0.18***	0.18***	0.19***
LOSS	+	0.09***	0.09***	0.05***
INV_REC	+	0.16***	0.17***	0.19***
SPITEM	+	0.12***	0.12***	0.11***
NSEG	+	0.05***	0.05***	0.04***
FOPS	+	0.27***	0.28***	0.25***
BIGN	+	0.30***	0.29***	0.24***
GCM	+	0.13***	0.14***	0.12***
REPORT_LAG	+	0.00***	0.00***	0.00***
TENURE	+	0.00**	0.00*	0.00*
EXPERT	+	0.09***	0.08***	0.07***
Industry Dummies		*Yes*	*Yes*	*Yes*
Year Dummies		*Yes*	*Yes*	*Yes*
N		6,708	6,708	6,708
Adjusted R^2		0.811	0.810	0.813

The multivariate regression results reported in table 5 are based on the following model:

$$LAUDIT_t = \alpha_0 + \beta_0 DISCLOSURE\_TONE_{t-1} + \beta_1 LOGAT_t + \beta_2 BM_t + \beta_3 BUSY_t + \beta_4 ROA_t$$
$$+ \beta_5 QUICK_t + \beta_6 LEVERAGE_t + \beta_7 LOSS_t + \beta_8 INVREC_t$$
$$+ \beta_9 SPITEM_t + \beta_{10} NSEG_t + \beta_{11} FOPS_t + \beta_{12} BIGN_t$$
$$+ \beta_{13} GCM_t + \beta_{14} REPORT\_LAG_t + \beta_{15} TENURE_t + \beta_{16} EXPERT_t + \varepsilon_{jt}.$$

Where the dependent variable (*LAUDIT*) is the natural log of fees (in 000s) paid to auditors for audit services. *DISCLOSURE_TONE* is my disclosure tone metric, the experimental variable, including prior year *NTONE* and *ABTONE* calculated as described in section 3.2. For other control variable definitions, please refer to Table 1. *,**,*** represent significance levels of 10 percent, 5 percent, and 1 percent, respectively. Following Krishnan et al. (2013), standard errors are clustered by the firm identifiers (gvkey). Similar results are found if standard errors are clustered with both firm identifiers and fiscal year (Petersen 2009 and Gow et al. 2010).

Table 6
Panel A: Testing the Association between Audit Fees and Disclosure Tone (High Litigation Industries: H2)

Variables	Predicted Sign	Coefficient	P-Value
INTERCEPT	?	3.48	0.00
LITIGATION	?	0.06	0.00
ABTONE	?	-0.03	0.00
LITI_ABTONE	?	-0.01	0.05
NTONE	?	-0.24	0.00
LOGAT	+	0.43	0.00
BM	-	-0.06	0.00
BUSY	+	0.10	0.00
ROA	-	-0.17	0.00
QUICK	-	-0.03	0.00
LEVERAGE	+	0.12	0.00
LOSS	+	0.07	0.03
INV_REC	+	0.25	0.00
SPITEM	+	0.14	0.00
NSEG	+	0.05	0.00
FOPS	+	0.33	0.00
BIGN	+	0.25	0.00
GCM	+	0.12	0.01
REPORT_LAG	+	0.00	0.00
TENURE	+	0.01	0.01
EXPERT	+	0.07	0.00
Industry Dummies		No	
Year Dummies		Yes	
N		6,708	
Adjusted R^2		0.805	

The regression results reported in table 6 are based on the following model:

$$LAUDIT_t = \alpha_0 + \beta_0 ABTONE_{t-1} + \beta_1 LITIGATION_{t-1} + \beta_2 ABTONE_{t-1} * LITIGATION_{t-1}$$

$$+ \beta_3 LOGAT_t + \beta_4 BM_t + \beta_5 BUSY_t + \beta_6 ROA_t$$

$$+ \beta_7 QUICK_t + \beta_8 LEVERAGE_t + \beta_9 LOSS_t + \beta_{10} INVREC_t$$

$$+ \beta_{11} SPITEM_t + \beta_{12} NSEG_t + \beta_{13} FOPS_t + \beta_{14} BIGN_t$$

$$+ \beta_{15} GCM_t + \beta_{16} REPORT\_LAG_t + \beta_{17} TENURE_t + \beta_{18} EXPERT_t + \varepsilon_{jt}.$$

Where the dependent variable (*LAUDIT*) is the natural log of fees (in 000s) paid to auditors for audit services. *Litigation* is the indicator variable for high litigation industries (following Ajinkya et al. 2005). For other control variable definitions, please refer to Table 1. *,**,*** represent significance levels of 10 percent, 5 percent, and 1 percent, respectively. Following Krishnan et al. (2013), standard errors are clustered by firm identifiers (gvkey). Similar results are found if standard errors are clustered with both firm identifiers and fiscal year (Petersen 2009 and Gow et al. 2010).

Table 7
Panel B: Testing the Association between Audit Fees and Disclosure Tone (Sarbanes Oxley Act: H2)

Variables	Predicted Sign	Coefficient	P-Value
INTERCEPT	?	2.55	0.00
SOX	?	0.78	0.00
ABTONE	?	-0.05	0.00
SOX_ABTONE	?	-0.01	0.24
NTONE	?	-0.20	0.00
LOGAT	+	0.45	0.00
BM	-	-0.04	0.01
BUSY	+	0.11	0.00
ROA	-	-0.15	0.00
QUICK	-	-0.04	0.00
LEVERAGE	+	0.20	0.00
LOSS	+	0.06	0.00
INV_REC	+	0.26	0.00
SPITEM	+	0.15	0.00
NSEG	+	0.05	0.00
FOPS	+	0.27	0.00
BIGN	+	0.24	0.00
GCM	+	0.14	0.01
REPORT_LAG	+	0.00	0.00
TENURE	+	0.00	0.03
EXPERT	+	0.08	0.00
Industry Dummies		Yes	
Year Dummies		No	
N		5,935	
Adjusted R^2		0.773	

The regression results reported in table 7 are based on the following model:

$$LAUDIT_t = \alpha_0 + \beta_0 ABTONE_{t-1} + \beta_1 SOX_{t-1} + \beta_2 ABTONE_{t-1} * SOX_{t-1}$$
$$+ \beta_3 LOGAT_t + \beta_4 BM_t + \beta_5 BUSY_t + \beta_6 ROA_t$$
$$+ \beta_7 QUICK_t + \beta_8 LEVERAGE_t + \beta_9 LOSS_t + \beta_{10} INVREC_t$$
$$+ \beta_{11} SPITEM_t + \beta_{12} NSEG_t + \beta_{13} FOPS_t + \beta_{14} BIGN_t$$
$$+ \beta_{15} GCM_t + \beta_{16} REPORT\_LAG_t + \beta_{17} TENURE_t + \beta_{18} EXPERT_t + \varepsilon_{jt}.$$

Where the dependent variable (*LAUDIT*) is the natural log of fees (in 000s) paid to auditors for audit services. *SOX* is the indicator variable for the post SOX sample period. For other control variable definitions, please refer to Table 1. *,**,*** represent significance levels of 10 percent, 5 percent, and 1 percent, respectively. Following Krishnan et al. (2013), standard errors are clustered by firm identifiers (gvkey). Similar results are found if standard errors are clustered with both firm identifiers and fiscal year (Petersen 2009 and Gow et al. 2010). I removed 2002 observations from the sample for this test.

Table 8
Panel A: Testing the Association between Audit Fees and Disclosure Tone
(Low Earnings informativeness: H3a and H3b)

Variables	Predicted Sign	Coefficient	P-Value
INTERCEPT	?	3.36	0.00
LOWINFO	?	0.03	0.02
ABTONE	?	-0.03	0.01
LOWINFO_ABTONE	?	-0.02	0.64
NTONE	?	-0.19	0.00
LOGAT	+	0.45	0.00
BM	-	-0.05	0.01
BUSY	+	0.10	0.00
ROA	-	-0.17	0.00
QUICK	-	-0.04	0.00
LEVERAGE	+	0.18	0.00
LOSS	+	0.06	0.00
INV_REC	+	0.26	0.00
SPITEM	+	0.11	0.00
NSEG	+	0.05	0.00
FOPS	+	0.26	0.00
BIGN	+	0.23	0.00
GCM	+	0.12	0.03
REPORT_LAG	+	0.00	0.00
TENURE	+	0.00	0.02
EXPERT	+	0.07	0.00
Industry Dummies		Yes	
Year Dummies		Yes	
N		6,587	
Adjusted R^2		0.813	

The regression results reported in table 8 is based on the following model:

$$LAUDIT_t = \alpha_0 + \beta_0 ABTONE_{t-1} + \beta_1 LOWINFO_{t-1} + \beta_2 ABTONE_{t-1} * LOWINFO_{t-1}$$
$$+ \beta_3 NTONE_t + \beta_4 LOGAT_t + \beta_5 BM_t + \beta_6 BUSY_t + \beta_7 ROA_t$$
$$+ \beta_8 QUICK_t + \beta_9 LEVERAGE_t + \beta_{10} LOSS_t + \beta_{11} INVREC_t$$
$$+ \beta_{12} SPITEM_t + \beta_{13} NSEG_t + \beta_{14} FOPS_t + \beta_{15} BIGN_t$$
$$+ \beta_{16} GCM_t + \beta_{17} REPORT\_LAG_t + \beta_{18} TENURE_t + \beta_{19} EXPERT_t + \varepsilon_{jt}.$$

Where the dependent variable (*LAUDIT*) is the natural log of fees (in 000s) paid to auditors for audit services. *LOWINFO* is the indicator variable which equals to 1 if a company's earnings informativeness is less than the median of the sample, and equals to 0 otherwise. Please see appendix III for the details of earnings informativeness calculation. For other variables definition, please refer to Table 1. *,**,*** represent significance levels of 10 percent, 5 percent, and 1 percent, respectively. Following Krishnan et al. (2013), the standard errors are clustered by the firm identifiers (gvkey). Similar results are found if standard errors are clustered on both firm identifiers and fiscal year (Petersen 2009 and Gow et al. 2010).

Appendix I

The following is a sample of forward looking statements excerpted from the management discussion and analysis part of the Intel Corporation's annual report filed on 2/14/2013 for the fiscal year that ended on 12/31/2012.

...

As we look into 2013, we expect revenue to grow in the low single digits with particular strength in our server market segment. We believe the renewed innovation in the PC industry that we fostered with Ultrabook systems and expanded to other thin and light form factors, will blur the lines between tablets and notebooks and provide growth opportunities in 2013. We also expect to launch new SoCs for smartphones and tablets, based on our 22nm process technology. In 2013, we expect an increase in capital expenditures primarily driven by beginning construction of a 450mm development facility as we progress toward manufacturing with 450 mm wafer technology later in the decade.

...

Appendix II

Decomposing the Tone

Following Huang et al. (2014), I decompose *TONE* into the normal component *NTONE* and the abnormal component *ABTONE*. The normal component is the part of the tone that could be explained by firm fundamental information, growth opportunities, operating risk, and complexity, which are all available to the general public at the time of 10k disclosure. The abnormal component is the part of the tone that is under the firm mangers' discretion, which is not explained by the firm fundamentals and the business environment. Specifically, *TONE* is decomposed by the following regression on the annual cross-sectional level. The *NTONE* is the predicted value, and the *ABTONE* is the residual from the following regression.

$$TONE_{jt} = \alpha_0 + \beta_0 EARNINGS_{jt} + \beta_1 RETURNS_{jt} + \beta_2 SIZE_{jt} + \beta_3 BTM_{jt} + \beta_4 STDRET_{jt} + \beta_5 STDEARN_{jt} + \beta_6 AGE_{jt} + \beta_7 BUSSEG_{jt} + \beta_8 GEOSEG_{jt} + \beta_9 LOSS_{jt} + \beta_{10} \Delta EARN_{jt} + \beta_{11} AFE_{jt} + \beta_{12} AF_{jt} + \sum Industry\ Dummies + \varepsilon_{jt}$$

The dependent variable is the principle component of raw tone scores (*TONE*) as defined in Table 1. The independent variables are defined the same as Huang et al. (2014):

EARNINGS = earnings before extraordinary items scaled by lagged total assets. *EARNINGS* is a variable to control for firm profitability;

RETURNS = contemporaneous annual stock returns. *RETURNS* is a variable to control for market expectation of future firm cash flow value;

SIZE = the natural logarithm of the market value of equity at the fiscal year end. Using alternative natural logarithm of total assets yield similar results as reported;

BTM = book to market ratio measured at the fiscal year end. *BTM* is a variable to control for firm growth opportunity;

STDRET = the standard deviation of monthly stock returns over the window of the last fiscal year, with at least eight months of data required;

STDEARN = the standard deviation of *EARNINGS* calculated over the window of the last five years, with at least three years of data required. *STDRET and STDEARN* are controls for the firm operating and business risk;

AGE = natural logarithm of one plus the number of years from the first year the firm entered COMPUSTAT, AGE controls for the firm's life cycle stages;

BUSSEG = natural logarithm of one plus number of business segments, or 1 if this variable has missing value from COMPUSTAT;

GEOSEG = natural logarithm of one plus number of geographic segments, or 1 if this variable has missing value from COMPUSTAT, *BUSSEG* and *GEOSEG* are controls for firm operating complexity;

LOSS = 1 if *EARNINGS* is negative, or 0 otherwise;

ΔEARN = change of earnings before extraordinary items scaled by beginning total assets;

AFE = analyst forecast error, defined as I/B/E/S earnings per share minus the median of the most recent analyst forecast, deflated by the stock price per share at the end of the fiscal year. *LOSS, ΔEARN* and *AFE* are used in this regression as earnings bench marks;

AF = analyst consensus forecast for the following year earnings per share, scaled by stock price per share at the end of the fiscal year. *AF* is a variable to control for managerial assessment about the firm's future performance;

Using the following year's return on assets to replace the analyst forecast (*AF*) for the following year also yield similar results as reported. Alternatively, my results are similar to reported results if I run the decomposing regression at the industry and year level.

Appendix III

Earnings Informativeness Calculation

Following Bird and Ruchti (2014), I calculate a measurement of earnings informativeness on the firm level. Specifically, I run the following regression on a 16 quarter rolling window for each firm year.

$$Return_t = \alpha + \beta_1 EPS_t + \beta_2 \Delta EPS_{t,\,t-1} + \varepsilon$$

The independent variable, *Return*, is the total stock return from the next day of prior quarter earnings announcement day to the next day of current quarter earnings announcement day. The dependent variables, EPS_t is the earnings per share deflated by the beginning stock price of current quarter, and $\Delta EPS_{t,\,t-1}$ is the change of earning per share. The earnings informativeness here is defined as how much stock returns are explained by the earnings and earnings change. Therefore, I sue the *R-Square* of the above regression as the measure of earnings informativeness. Another possible measure of earnings informativeness is the sum of β_1 and β_2 for each firm, similar results as reported are obtained if I use this alternative proxy.

The reason why I didn't regress the abnormal return on the earnings surprises here is because the analyst forecast errors are typically used as proxies for earnings surprises in such regressions, and the forecast errors are known under the influence of the disclosure tone (Kothari et al. 2009). Therefore, it is not clear that the earnings response coefficients calculated this way will be a better proxy of the informativeness of the reported earnings numbers only.

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Journal of Business, Economics and Finance, Vol 3, Issue 3, pp.328-340, 2014

WORKING PAPER

Why Do Private Banks Chose High Quality Auditors?

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Earnings Smoothing and Audit Fees

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NON-ACCOUNTING PUBLICATIONS

The Growth of Sickle Hemoglobin Polymers, with A. Aprelev and F.A. Ferrone
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Free Energy of Sickle Hemoglobin Polymerization, with W. Weng, V.L. Lew and F.A. Ferrone
Biophysical Journal, Vol. 94, Issue 9, pp. 3629-3634, 2008.